Rays and Skates

Rays and Skates are part of the group known as *Elasmobranchs* (Wilga et al., 2007). *Elasmobranchii* are one of the main groups of chondrichthyan fishes, next to *Holocephali* or chimeras (Wilga et al., 2007). Rays and Skates are known as the *Batoidae* sub-group within the larger group of the Elasmobranch, which also contains sharks (Wilga et al., 2007). It can be discussed whether or not Rays and Skates can be considered top-predators in the North Sea, as this study found evidence of Rays and Skates being predated by other 'true' top-predators. This, however, only occurred very rarely and mostly when the individual is not fully grown, which could suggest that full-grown Rays and Skates can be considered top-predators. For these reasons, this study will henceforth refer to Rays and Skates as 'near top-predators'. Examples of species that can only be found in the North Sea are: the Blue skate (Dipturus batis), Thornback ray (Raja clavata), and Smalleyed ray (Raja microocellata) (Bom et al., 2022; George, 2009; Poiesz et al., 2021). No research was found suggesting that species have disappeared or invasive species have taken hold in the North Sea.

History/ Population trends

Throughout their evolutionary history during at least 400 million years, the cartilaginous fishes (*Chondrichthyes*) in general, and sharks in particular, remained major components of marine communities, having the ability to adapt to varying selective pressures (Wilga et al., 2007). However, elasmobranchs are considered particularly vulnerable to anthropogenic pressures as their life-history traits result in low rates of population growth (Walker & Hislop, 1998; Sguotti et al., 2016). To grasp the extent to which humans can affect Elasmobranchii, there have been data reviews and surveys made on the group since the late 20th century. According to the information that was gathered elasmobranch landings have fluctuated between high and low landings since the 1930s, seeing relative stabilization in the years following 1970 (Walker & Heessen, 1996).

Miscellaneous

- The largest species within the family of *Batoidae* is the Giant manta ray (*Mobula birostris*), sometimes also known as the Giant oceanic manta ray (Marquez, 2022). The largest species within the North Sea is the Blue skate, with a maximum length of around 3m (Bom et al., 2022).

Diet

- Whiting (George, 2009)
- Mackerel (George, 2009)
- Herring (George, 2009)
- Sprat (George, 2009)
- Sandeel (George, 2009)
- Crustaceans (George, 2009)
- Cephalopods (George, 2009)
- Small flatfish (George, 2009)
- Annelida (George, 2009)

Sources

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